

Getting by with a little help from friends and colleagues

Testing how residents' social support networks affect loneliness and burnout

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Abstract

Objective To determine how residents' relationships with their sources of social support (ie, family, friends, and colleagues) affect levels of burnout and loneliness.

Design Cross-sectional survey.

Setting Faculty of Medicine at the University of British Columbia in Vancouver.

Participants A total of 198 physician-trainees in the university's postgraduate medical education program.

Main outcome measures Residents' personal and work-related burnout scores (measured using items from the Copenhagen Burnout Inventory); loneliness (measured using a 3-item loneliness scale); and social support (assessed with the Lubben Social Network Scale, version 6).

Results Of the 234 respondents who completed the Internet-based survey (a 22% response rate), 198 provided complete information on all study variables and thus constituted the analytic sample. Seemingly unrelated regression analyses indicated that loneliness was significantly ($P < .01$) and positively associated with both personal and work-related burnout scores. Greater friend-based and colleague-based social support were both indirectly associated with lower personal and work-related burnout scores through their negative associations with loneliness.

EDITOR'S KEY POINTS

- Burnout is a set of negative feelings generated by work-related stress and consists of emotional exhaustion, depersonalization, and decreased sense of personal accomplishment. Residency training presents physician-trainees with demands and challenges that can increase their risk of burnout. Residency stressors also potentially increase the risk of loneliness, and loneliness might contribute to resident burnout through energy-depleting interactions with patients.

- This study tested a series of hypotheses to determine the role of social support in residency burnout and found the following: a higher level of loneliness was significantly associated with higher levels of both personal and work-related burnout ($P < .01$); more friend-based and colleague-based support were both significantly associated with lower levels of loneliness ($P < .05$); and higher friend and colleague support were indirectly associated with lower personal and work-related burnout via lower levels of loneliness.

Conclusion Social relationships might help residents mitigate the deleterious effects of burnout. By promoting interventions that stabilize and nurture social relationships, hospitals and universities can potentially help promote resident resilience and well-being and, in turn, improve patient care.

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S'en sortir avec le soutien des amis et des collègues

Vérifier comment les réseaux de soutien social des résidents agissent sur la solitude et le burnout

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Résumé

Objectif Déterminer comment les relations d'un résident avec ceux qui lui apportent un soutien social (c.-à-d. famille, amis et collègues) agissent sur l'intensité d'un burnout ou d'un sentiment de solitude.

Type d'étude Enquête transversale via l'Internet.

Contexte La faculté de médecine de l'Université de la Colombie-Britannique à Vancouver.

Participants Un total de 198 étudiants en médecine inscrits au programme de troisième cycle des études médicales.

Principaux paramètres à l'étude Les scores de burnout personnel ou professionnel (mesurés à l'aide des items du *Copenhagen Burnout Inventory*); le sentiment de solitude (mesuré sur une échelle de solitude de 3 degrés); et le soutien social (évalué au moyen du *Lubben Social Network Scale*, version 6).

Résultats Sur les 234 répondants (taux de réponse de 22%), 198 ont fourni des informations sur toutes les variables à l'étude, formant ainsi l'échantillon analytique. Des analyses de régression apparemment indépendantes ont montré une relation directe significative entre le sentiment de solitude et le score de burnout personnel ou professionnel ($P < .01$). Et parce qu'un bon soutien social est associé à un moindre sentiment de solitude, il y avait une relation indirecte entre un meilleur soutien de la part des amis et des collègues et un score moins élevé de burnout personnel ou professionnel.

Conclusion De bonnes relations sociales pourraient atténuer les effets nocifs d'un burnout. Par des interventions qui favorisent et entretiennent les relations sociales, les hôpitaux et les universités pourraient contribuer à augmenter le bien-être et la résilience des résidents, améliorant ainsi les soins aux patients.

POINTS DE REPÈRE DU RÉDACTEUR

- Le burnout est un ensemble de sentiments négatifs résultant d'un stress au travail: il se manifeste par un épuisement émotionnel, une dépersonnalisation et une baisse du sentiment d'accomplissement personnel. La formation des résidents en médecine comporte des exigences et des défis qui peuvent accroître le risque de burnout. Ces éléments de stress peuvent aussi augmenter le risque de solitude, un facteur qui pourrait contribuer au burnout parce que les interactions avec les patients exigent beaucoup d'énergie.

- Cette étude cherchait à vérifier une série d'hypothèses à propos du rôle que joue le soutien social en cas de burnout chez un résident. Voici ce qu'elle a permis d'observer: il y a une relation significative entre un niveau élevé d'isolement et un niveau plus élevé d'épuisement personnel ou professionnel ($P < .01$); entre un meilleur soutien des amis ou des collègues et un moindre sentiment de solitude ($P < .05$); et, indirectement, entre un bon soutien des amis ou des collègues et une moindre possibilité d'épuisement personnel ou professionnel, en raison d'un plus faible niveau de solitude.

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Residency training presents physician-trainees with demands and challenges that can increase their risk of burnout. Burnout is a set of negative feelings generated by work-related stress and consists of 3 elements: emotional exhaustion, depersonalization, and decreased sense of personal accomplishment.^{1,2} Potential risk factors include the following: long work hours, imbalance between work life and personal life, and low work autonomy³—all of which are common features of residency training. Although prevalence estimates vary considerably, evidence from many studies indicates that burnout is highly prevalent among residents.⁴ Burnout has many health- and job-related consequences, including depression, substance misuse, poor job performance, absenteeism,⁵⁻⁷ and problematic patient care,⁴ posing considerable implications for both providers and patients.

The present study investigates how residents' families, friends, and colleagues—3 potentially important sources of social support—might be associated with levels of resident burnout. Social relationships can bolster resilience to a range of stressors^{8,9} and help maintain or improve physical and mental health.¹⁰ We examine objective and subjective components of social relationships. Objective components include the number and types of relationships that a person has, as well as the content of those relationships in terms of the support they provide, that is, emotional (eg, expressions of love, caring, and encouragement), instrumental (provision of behaviour or material aid), and informational (provision of facts or advice) support.¹⁰ Family and friends are common sources of social support. Residents' access to these sources of support, however, can be hindered by their work responsibilities and, for some, geographic relocation. In the workplace, medical colleagues might be another source of potential support. Research has identified co-workers as an important form of support for relieving work-related stress¹¹ and burnout.¹²

The subjective component of social relationships entails an individual's own sense of attachment to or alienation from the people in his or her life, which can be considered in terms of one's degree of loneliness¹³—the complex set of feelings that cause one to seek fulfilment of unmet intimate and social needs.¹⁴ Residency stressors potentially increase the risk of loneliness,¹⁵ and loneliness among outpatient health care providers has been indirectly associated with burnout.¹⁶ It might be possible that loneliness contributes to resident burnout through the providing of patient care. Those experiencing burnout will often attribute at least some portion of burnout to energy-depleting interactions with patients.¹⁷

In addition to these direct mechanisms that might link social support and loneliness with burnout, social support might indirectly affect burnout through its effects on loneliness. Debate exists regarding whether loneliness is either stable or fluctuates with life stressors and

hormonal changes.¹⁸ If loneliness fluctuates, then social support could aid in preventing or alleviating residents' loneliness and the potential risk of burnout.

Despite these plausible direct and indirect mechanisms, few studies of medical residents have examined social support networks, loneliness, and their relationship to burnout. These studies have generally focused on work relationships and support (eg, from supervisors and colleagues) as ways to reduce residency burnout, with less attention paid to measuring support from family and friends.^{4,19}

Our goal was to address these knowledge gaps by analyzing data we collected via a 2014 survey of medical residents in British Columbia. We tested the following 3 hypotheses: greater social support will be associated with lower levels of burnout; increased loneliness will be associated with higher levels of burnout; and greater social support will be associated with lower levels of burnout via the mediating influence of lower loneliness.

METHODS

Data collection

To test these hypotheses, we used data collected from residents in the Faculty of Medicine's Postgraduate Medical Education Program at the University of British Columbia in Vancouver via an Internet-based survey conducted between February and April of 2014. An e-mail inviting participation in the study was sent by the Faculty of Medicine to 1082 of the 1233 total residents in the program. This invitation described the study and provided a web link to the survey. Inducement for participation consisted of the opportunity to enter a drawing for 4 \$50 gift cards to local stores. The study received approval from the University of British Columbia Behaviour Research Ethics Board.

Measures

Dependent variables. Burnout was assessed using items from the Copenhagen Burnout Inventory, which was designed to assess the 3 subdomains of burnout: emotional exhaustion, depersonalization, and decreased sense of personal accomplishment.²⁰ We used items from 2 Copenhagen Burnout Inventory subscales that focus on personal (6 items) and work-related (4 items) fatigue and exhaustion. We did not include the patient-related subdomain because of a data collection error due to item wording just for those specific subscale items, and for which we decided to limit our analyses to the other 2 subscales. **Box 1** details the wording of the personal and patient-related subscale items. Owing to skewed responses resulting in empty cells, the 5-point response scales of each of these items (never, seldom, sometimes, often, always) were collapsed to create

Box 1. Items used from the Copenhagen Burnout Inventory

Personal burnout

- How often do you feel tired?
- How often are you physically exhausted?
- How often are you emotionally exhausted?
- How often do you think, "I can't take it anymore"?
- How often do you feel worn out?
- How often do you feel weak and susceptible to illness?

Work-related burnout

- Do you feel worn out at the end of the working day?
- Are you exhausted in the morning at the thought of another day at work?
- Do you feel that every working hour is tiring for you?
- Do you have enough energy for family and friends during leisure time?

Data from Kristensen et al.²⁰

binary variables assessing whether specific feelings and experiences occurred never, seldom, or sometimes (coded 0) or often or always (coded 1). The items were summed to create subscale scores for, respectively, personal and work-related burnout. We analyzed these 2 subscales as separate variables owing to analyses indicating that, although correlated (Pearson $r = .756$), they still retained substantial unique variance.

Independent variables. Loneliness was measured using a 3-item loneliness scale,²¹ which assessed the degree to which the respondent felt that he or she lacked companionship, felt left out, and felt isolated from others. Each item had a 3-point response scale: hardly ever (coded 1), some of the time (coded 2), and often (coded 3). A loneliness score was computed by summing these 3 questions, such that higher scores indicate greater loneliness.

Social support was assessed with the Lubben Social Network Scale (LSNS), version 6, modified to also assess perceived social support from resident-colleagues in addition to family and friends. In version 6 of the LSNS, the 3 items for each of relatives and friends focus on the number of relatives and friends that a respondent sees or hears from at least once per month, feels at ease with to talk about private matters, and feels close to and will call on for help. To assess colleague social support, we added another 3 analogous items. Responses to each of these 9 items were based on a 6-point scale ranging from "none" (0) to "9 or more" (5). Previous research on the LSNS indicates that a score of less than 6 suggests high risk of social isolation.²² Psychometric evaluation of these 3 subscales indicated that they overlapped but were conceptually distinct.

Our analysis included controlling several confounding factors: residency program, residency year, perceived work autonomy (assessed using a single question with a 5-item response scale ranging from very low to very high), sex, year of birth, race or ethnicity, marital status, born in Canada versus elsewhere, having children, number of serious life events experienced (eg, death of a first-degree relative; death of a child; house, apartment, or condominium purchase), and self-rated changes in both mental and physical health since starting residency (both coded on a 5-item scale ranging from much worse to much better).

Statistical analyses

Owing to the correlations between personal and work-related burnout and loneliness, we tested our hypotheses by estimating a set of linear regression equations simultaneously as part of a seemingly unrelated regression model in Stata 13. Rather than estimating separate ordinary least squares equations, a seemingly unrelated regression model allows for more efficient estimates.²³

For our indirect effect hypothesis, we tested for mediating effects by using the product of coefficients approach,²⁴ whereby the indirect effect between each type of social support and type of burnout was computed by multiplying the slope coefficients that constitute the 2 paths of the hypothesized mediating effect: (path a) from one type of social support to the hypothesized mediating factor of loneliness and (path b) from loneliness to each type of burnout outcome. The statistical significance of each indirect effect was determined using bias-corrected 95% CIs derived from bootstrapping procedures using 500 replications.

RESULTS

Among the 234 respondents who completed the survey (constituting a response rate of 22%), 226 had complete (non-missing) information on the burnout measures (our key dependent variables). Of these, 198 had complete information on all other study variables and constituted our analytic sample.

Table 1 lists the descriptive statistics for all our study variables and reliability estimates (Cronbach α) for all multi-item scales. All composite scales demonstrated acceptable reliability. Our sample was predominantly female, white, married or partnered, born in Canada, and training in family practice and non-surgical specialties.

Table 2 details results for the test of the first hypothesis: greater social support will be associated with lower burnout. The model 1 results indicate that higher levels of friend-based support are significantly associated with a lower work-related burnout score ($b = -0.062$; $P < .05$). However, once loneliness is controlled for (in model 2),

Table 1. Descriptive statistics of study variables (N = 198): A) Reliability estimates (Cronbach α) for multi-item scales; B) Respondents' characteristics.

A) VARIABLES	MEAN (SD) SCORE*	CRONBACH α
Type of burnout		
• Personal	2.96 (1.98)	.82
• Work-related	1.46 (1.30)	.71
Loneliness	5.44 (1.84)	.83
Source of social support		
• Relatives	8.22 (2.37)	.75
• Friends	7.80 (3.25)	.82
• Colleagues	6.44 (3.21)	.84
B) RESPONDENTS' CHARACTERISTICS	VALUE†	
Year of residency, %		
• 1	33.33	
• 2	33.33	
• 3	12.63	
• 4	9.09	
• ≥ 5	11.62	
Residency program, %		
• Family practice	43.43	
• Non-surgical specialty	47.98	
• Surgical specialty	8.59	
Work autonomy, mean (SD)†	2.94 (1.03)	
Male sex, %	27.78	
Year of birth, mean (SD)	1981.86 (4.92)	
Race or ethnicity, %		
• White	66.16	
• Asian	22.73	
• Other	11.11	
Marital status, %		
• Married	53.03	
• Partnered (non-cohabitating) or cohabitating	30.30	
• Single, divorced, or widowed	16.67	
Not born in Canada, %	30.81	
Has children, %	23.23	
Total major life events, mean (SD)	1.88 (1.30)	
Change in mental health since starting residency, mean (SD)‡	2.62 (0.95)	
Change in physical health since starting residency, mean (SD)‡	2.61 (0.94)	

*Higher scores indicate higher levels of personal burnout (scores=0-6) or work-related burnout (scores=0-4), higher levels of loneliness (scores=3-9), and higher levels of social support from friends (scores=0-15), colleagues (scores=0-15), and relatives (scores=2-14).

†Values have been rounded.

‡Scored on a 5-point scale from very low to very high.

§Scored on a 5-point scale from much worse to much better.

this initial association for friend-based support is attenuated and is no longer statistically significant.

Model 2 also shows results for the test of the second hypothesis: loneliness will be positively associated with burnout. A higher level of loneliness was significantly ($P < .01$) associated with both higher personal ($b = 0.280$) and work-related ($b = 0.190$) burnout scores.

Finally, for the third hypothesis (ie, social support is associated with burnout via its influence on loneliness), we tested whether each of the 3 sources of social support was associated with loneliness. As shown in the final column of **Table 2**, higher support from friends and colleagues were each significantly associated with lower loneliness scores ($b = -0.098$ and $b = -0.077$, respectively; $P < .05$). Having established that friend and colleague support were both statistically significantly associated with loneliness and that loneliness was statistically significantly associated with both burnout outcomes, we then estimated the mediating effects of loneliness in the relationship between friend and colleague support and each burnout outcome. **Table 3** reports the indirect effects for friend and colleague support on each burnout outcome. All 4 estimates were significant ($P < .05$), indicating that higher friend and colleague support are both indirectly associated with lower personal and work-related burnout scores via lower loneliness.

DISCUSSION

This study examined the extent to which resident burnout was associated with different sources of social support. Our analyses testing for direct associations between social support and burnout initially indicated that residents who have more support from friends experience less work-related burnout. However, this association was attenuated and became non-significant once loneliness was controlled for. Although protective effects of collegial support on burnout have been reported,^{12,25} scant evidence exists on the effects of non-colleague support on burnout. Hence, this lack of evidence for a statistically significant direct effect is still a useful addition to the existing evidence base on residency burnout. Our study did not test for the opposite effect—whether stressful social ties are associated with increased levels of burnout; however, we do believe this would be an important focus for future investigations.

Consistent with our second hypothesis, we found that loneliness positively correlates with both personal and work-related burnout. These findings corroborate results observed among community psychotherapists¹⁶ and counseling trainees.²⁶ Although health care has adopted more interdisciplinary approaches to patient care, many clinicians still spend much of their workday practising in isolation. When interaction does occur, the physician is

Table 2. Unstandardized slope coefficients (95% CIs) for personal and work-related burnout and loneliness: N = 198.

VARIABLE	PERSONAL BURNOUT, SLOPE COEFFICIENT (95% CI)*		WORK-RELATED BURNOUT, SLOPE COEFFICIENT (95% CI)*		LONELINESS, SLOPE COEFFICIENT (95% CI), R ² = 0.363
	MODEL 1, R ² = 0.412	MODEL 2, R ² = 0.456	MODEL 1, R ² = 0.375	MODEL 2, R ² = 0.421	
Social support source					
• Relatives	-0.014 (-0.123 to 0.095)	0.004 (-0.102 to 0.109)	-0.033 (-0.107 to 0.041)	-0.021 (-0.093 to 0.050)	-0.061 (-0.167 to 0.044)
• Friends	-0.040 (-0.123 to 0.042)	-0.013 (-0.093 to 0.067)	-0.062 [†] (-0.118 to -0.007)	-0.044 (-0.098 to 0.011)	-0.098 [†] (-0.178 to -0.019)
• Colleagues	0.012 (-0.065 to 0.089)	0.033 (-0.041 to 0.108)	-0.004 (-0.449 to -0.155)	0.010 (-0.040 to 0.061)	-0.077 [†] (-0.152 to -0.003)
Loneliness	NA	0.280 [†] (0.142 to 0.419)	NA	0.190 [†] (0.096 to 0.284)	NA
Constant	-14.85 (-133.63 to 103.94)	-23.80 (-138.21 to 90.61)	-58.65 (-139.03 to 21.73)	-64.73 (-142.14 to 12.68)	31.95 (-83.02 to 146.92)

NA—not applicable, SUR—seemingly unrelated regression.

*All models control for all variables listed in Table 1. Results for model 1 for personal and work-related burnout are estimated from the same SUR model. Results for model 2 for both burnout outcomes and loneliness are estimated from the same SUR model.

[†]P < .05.

[†]P < .01.

Table 3. Indirect effect (bias-corrected 95% CIs) of social support sources (ie, relative, friend, and colleague) on personal and work-related burnout via loneliness: N = 198.

SOURCE OF SUPPORT*	PERSONAL BURNOUT, SLOPE COEFFICIENT (BIAS-CORRECTED 95% CI)	WORK-RELATED BURNOUT, SLOPE COEFFICIENT (BIAS-CORRECTED 95% CI)
Relative support via loneliness	NA	NA
Friend support via loneliness	-.028 [†] (-.065 to -.001)	-.019 [†] (-.045 to -.002)
Colleague support via loneliness	-.022 [†] (-.057 to -.000)	-.015 [†] (-.038 to -.000)

NA—not applicable.

*For each form of support, the indirect effect for loneliness is adjusted for all other variables listed in Table 1; form of support is NA (and not statistically significant) because one or both constituent paths are not statistically significant.

[†]Statistically significant (P < .05).

usually in a position that requires him or her to exercise authority in providing clinical expertise, further undermining the likelihood of meaningful social interaction.

Finally, our findings are consistent with our third hypothesis regarding the indirect effects of social support on burnout via loneliness: more friend and colleague support was associated with lower levels of loneliness. These findings corroborate previous research,^{27,28} but also implicate the role of loneliness in understanding the association between social support and resident burnout, which, to our knowledge, has not been examined in previous research.

Strengths and limitations

Our findings highlight potentially useful areas for future research on resident burnout. Nevertheless, they need to be considered with respect to several potential limitations. First, our cross-sectional data limit drawing any causal conclusions from our findings. We were able to control for change in mental and physical health status since starting residency; however, a prospective cohort design would better enable observing changes in residents' networks and burnout risk as they progress through their residency training.

Second, skewed responses to the burnout questions required us to focus on the most severe levels of burnout symptoms. A larger sample would have likely led to more response variance and allowed us to better investigate variation in burnout across different specialties and program years.

Third, our response rate could indicate a possible systematic nonresponse bias, whereby residents with either low or high levels of burnout chose to not complete the survey. Nevertheless, response rate does not necessarily indicate nonresponse bias.^{29,30} Furthermore, our response rate was consistent with rates obtained for other medical professional surveys, which often have modest response rates.^{31,32} It should be noted, however, that this response rate might affect the validity of our findings.

Fourth and finally, our sample consisted of residents from one Canadian university and province. Thus, the extent to which our findings can be generalized to other universities and geographic locations is uncertain. Nevertheless, Canadian residency programs are held to national accreditation standards in order to ensure the uniformity and portability of each program.³²

Conclusion

This study empirically tested hypothesized pathways for how social support might be associated with residency burnout—an outcome that has important implications for improving the well-being of residents and the quality of care they provide to their patients. Our findings suggest that friend and colleague social support might reduce personal and work-related burnout via mitigating loneliness. While further research on social ties and burnout is required, we propose that initiatives to prevent and reduce burnout among residents focus on the stability and growth of residents' relationships with their friends and colleagues. This focus has received empirical support in addressing burnout among physicians³³ and thus might be useful in helping residents as well. 🌿

Dr Rogers is a resident in the Department of Family Practice, **Ms Polonijo** is a doctoral student in the Department of Sociology, and **Dr Carpiano** is Professor in the Department of Sociology, all at the University of British Columbia in Vancouver.

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Contributors

Dr Rogers generated the concept of the study, constructed the method of data acquisition and provided substantial input on data interpretation, and drafted the article. **Ms Polonijo** provided substantial support in data analysis and interpretation and provided critical review of the study. **Dr Carpiano** substantially contributed to the concept and design of the study, as well as input on data interpretation, and revised the article critically for important intellectual content. All authors approved the final version of the manuscript submitted for publication and all act as guarantors of the work.

Competing interests

None declared

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